WHAT IS CLAIMED IS:

1. A system for planning repairs in response to demand in a multi-level repair network, each level within the repair network comprising one or more repair locations at which unserviceable parts may be repaired, the system comprising one or more components collectively operable to:

access a forecasted demand for a specified quantity of serviceable parts at a specified future time at a repair location;

in a first phase, for each of one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

estimate the earliest time at which a repair operation can begin for the part at an upstream repair location; and

plan a move order for moving the part between the repair location and the upstream repair location such that the part can be available for repair at the upstream repair location at the estimated earliest time, the move order having a start time and a delivery time;

in a second phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase, estimate a latest time at which a repair operation can begin with respect to the part at the upstream repair location in order to help satisfy the forecasted demand at the repair location; and

plan a repair order for the part at the upstream repair location at the estimated latest time, the repair order having a start time;

in a third phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the start time of the repair order planned in the second phase, re-plan the move order by modifying the delivery time of the move order according to the start time of the repair order and modifying the start time of the move order according to the modified delivery time of the move order;

the start time of the re-planned move order being an estimated latest time at which the part can be moved from the repair location to the upstream repair location for repair in order to help satisfy the forecasted demand at the repair location.

2. The system of Claim 1, wherein:

the earliest time estimated in the first phase takes into account any move lead time required for moving the part from the repair location to the upstream repair location and any inspection lead time required for inspecting the part at the upstream repair location;

the latest time estimated in the second phase takes into account any repair lead time required for repairing the part at the upstream repair location and any move lead time required for moving the part back from the upstream repair location to the repair location; and

the start time of the re-planned move order is an estimated latest time taking into account any move lead time required for moving the part from the repair location to the upstream repair location, any inspection lead time required for inspecting the part at the upstream repair location, any repair lead time required for repairing the part at the upstream repair location, and any move lead time required for moving the part back from the upstream repair location to the repair location.

3. The system of Claim 2, wherein a repair lead time associated with a repair operation is specified for each part for each repair location and comprises one or more full days.

4. The system of Claim 2, wherein the move order specifies a Bill of Distribution (BOD) and the move lead time associated with the move order comprises one or more full days.

5. The system of Claim 1, wherein the repair order and associated re-planned move order are planned on a just-in-time basis.

6. The system of Claim 1, wherein the repair order and associated re-planned move order are planned on an on-demand basis, the forecasted demand acting as a demand for generating the repair order and the repair order acting as a demand for generating the associated re-planned move order.

7. The system of Claim 1, wherein a part is available to help satisfy the forecasted demand if the part can be at the repair location in a serviceable state at the specified time of the forecasted demand or earlier.

8. The system of Claim 1, wherein the one or more components are further collectively operable to automatically approve planned repair orders and move orders satisfying one or more predefined constraints.

9. The system of Claim 1, wherein the first, second, and third phases are performed for each of a plurality of times within a planning horizon for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location.

10. The system of Claim 1, wherein the first, second, and third phases are performed for each of a plurality of repair locations in a level of the repair network, the first, second, and third phases being performed for each inspected unserviceable parts at each such repair location that is not repairable at that repair location.

11. The system of Claim 1, wherein the repair location is in a first level of the repair network and the upstream repair location is in a second level of the repair network, the one or more components further collectively operable to:

in the first phase, for any of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location and which may also not be repairable at the upstream repair location in the second level:

estimate the earliest time at which a repair operation can begin for the part at an upstream repair location in a third level of the repair network; and

plan a second move order for moving the part between the upstream repair location in the second level and the upstream repair location in the third level such that the part can be available for repair at the upstream repair location in the third level at the estimated earliest time, the second move order having a start time and a delivery time;

in the second phase, for each of these one or more inspected unserviceable parts at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase for the upstream repair location in the third level, estimate a latest time at which a repair operation can begin with respect to the part at the upstream repair location in the third level in order to help satisfy the forecasted demand at the repair location; and

plan a repair order for the part at the upstream repair location in the third level at the estimated latest time for the upstream repair location in the third level, this repair order having a start time;

in the third phase, for each of these one or more inspected unserviceable parts at the repair location.

according to the start time of this repair order planned in the second phase, re-plan the second move order by modifying the delivery time of the second move order according to the start time of this repair order and modifying the start time of the second move order according to the modified delivery time of the second move order;

the start time of the re-planned second move order being an estimated latest time at which the part can be moved from the upstream repair location in the

second level to the upstream repair location in the third level for repair in order to help satisfy the forecasted demand at the repair location.

12. The system of Claim 11, wherein:

the earliest time estimated in the first phase takes into account any move lead time required for moving the part from the upstream repair location in the second level to the upstream repair location in the third level and any inspection lead time required for inspecting the part at the upstream repair location in the third level, in addition to any move lead time required for moving the part from the repair location to the upstream repair location in the second level and any inspection lead time required for inspecting the part at the upstream repair location in the second level;

the latest time estimated in the second phase takes into account any repair lead time required for repairing the part at the upstream repair location in the third level and any move lead time required for moving the part back from the upstream repair location in the third level to the upstream repair location in the second level, in addition to any move lead time required for moving the part back from the upstream repair location in the second level to the repair location; and

the start time of the re-planned second move order is an estimated latest time taking into account any move lead time required for moving the part from the upstream repair location in the second level to the upstream repair location in the third level, any inspection lead time required for inspecting the part at the upstream repair location in the third level, any repair lead time required for repairing the part at the upstream repair location in the third level, and any move lead time required for moving the part back from the upstream repair location in the third level to the upstream repair location in the second level, in addition to any move lead time required for moving the part from the repair location to the upstream repair location in the second level, any inspection lead time required for inspecting the part at the upstream repair location in the second level, and any move lead time required for moving the part back from the upstream repair location in the second level to the repair location.

13. The system of Claim 11, wherein the first, second, and third phases are performed for each repair location in each level of the repair network, the first, second, and third phases being performed for each inspected unserviceable part at each such repair location that is not repairable at that repair location.

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14. The system of Claim 1, wherein the system comprises a replenishment planning engine of a service parts planning system.

15. A method for planning repairs in response to demand in a multi-level repair network, each level within the repair network comprising one or more repair locations at which unserviceable parts may be repaired, the method comprising:

accessing a forecasted demand for a specified quantity of serviceable parts at a specified future time at a repair location;

in a first phase, for each of one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

estimating the earliest time at which a repair operation can begin for the part at an upstream repair location; and

planning a move order for moving the part between the repair location and the upstream repair location such that the part can be available for repair at the upstream repair location at the estimated earliest time, the move order having a start time and a delivery time;

in a second phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase, estimating a latest time at which a repair operation can begin with respect to the part at the upstream repair location in order to help satisfy the forecasted demand at the repair location; and

planning a repair order for the part at the upstream repair location at the estimated latest time, the repair order having a start time;

in a third phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the start time of the repair order planned in the second phase, re-planning the move order by modifying the delivery time of the move order according to the start time of the repair order and modifying the start time of the move order according to the modified delivery time of the move order;

the start time of the re-planned move order being an estimated latest time at which the part can be moved from the repair location to the upstream repair location for repair in order to help satisfy the forecasted demand at the repair location.

16. The method of Claim 15, wherein:

the earliest time estimated in the first phase takes into account any move lead time required for moving the part from the repair location to the upstream repair location and any inspection lead time required for inspecting the part at the upstream repair location;

the latest time estimated in the second phase takes into account any repair lead time required for repairing the part at the upstream repair location and any move lead time required for moving the part back from the upstream repair location to the repair location; and

the start time of the re-planned move order is an estimated latest time taking into account any move lead time required for moving the part from the repair location to the upstream repair location, any inspection lead time required for inspecting the part at the upstream repair location, any repair lead time required for repairing the part at the upstream repair location, and any move lead time required for moving the part back from the upstream repair location to the repair location.

17. The method of Claim 16, wherein a repair lead time associated with a repair operation is specified for each part for each repair location and comprises one or more full days.

18. The method of Claim 16, wherein the move order specifies a Bill of Distribution (BOD) and the move lead time associated with the move order comprises one or more full days.

19. The method of Claim 15, wherein the repair order and associated re-planned move order are planned on a just-in-time basis.

20. The method of Claim 15, wherein the repair order and associated re-planned move order are planned on an on-demand basis, the forecasted demand acting as a demand for generating the repair order and the repair order acting as a demand for generating the associated re-planned move order.

21. The method of Claim 15, wherein a part is available to help satisfy the forecasted demand if the part can be at the repair location in a serviceable state at the specified time of the forecasted demand or earlier.

22. The method of Claim 15, further comprising automatically approving planned repair orders and move orders satisfying one or more predefined constraints.

23. The method of Claim 15, wherein the first, second, and third phases are performed for each of a plurality of times within a planning horizon for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location.

24. The method of Claim 15, wherein the first, second, and third phases are performed for each of a plurality of repair locations in a level of the repair network, the first, second, and third phases being performed for each inspected unserviceable parts at each such repair location that is not repairable at that repair location.

25. The method of Claim 15, wherein the repair location is in a first level of the repair network and the upstream repair location is in a second level of the repair network, the method further comprising:

in the first phase, for any of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location and which may also not be repairable at the upstream repair location in the second level:

estimating the earliest time at which a repair operation can begin for the part at an upstream repair location in a third level of the repair network; and

planning a second move order for moving the part between the upstream repair location in the second level and the upstream repair location in the third level such that the part can be available for repair at the upstream repair location in the third level at the estimated earliest time, the second move order having a start time and a delivery time;

in the second phase, for each of these one or more inspected unserviceable parts at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase for the upstream repair location in the third level, estimating a latest time at which a repair operation can begin with respect to the part at the upstream repair location in the third level in order to help satisfy the forecasted demand at the repair location; and

planning a repair order for the part at the upstream repair location in the third level at the estimated latest time for the upstream repair location in the third level, this repair order having a start time;

in the third phase, for each of these one or more inspected unserviceable parts at the repair location.

according to the start time of this repair order planned in the second phase, re-planning the second move order by modifying the delivery time of the second move order according to the start time of this repair order and modifying the start time of the second move order according to the modified delivery time of the second move order;

the start time of the re-planned second move order being an estimated latest time at which the part can be moved from the upstream repair location in the

second level to the upstream repair location in the third level for repair in order to help satisfy the forecasted demand at the repair location.

26. The method of Claim 25, wherein:

the earliest time estimated in the first phase takes into account any move lead time required for moving the part from the upstream repair location in the second level to the upstream repair location in the third level and any inspection lead time required for inspecting the part at the upstream repair location in the third level, in addition to any move lead time required for moving the part from the repair location to the upstream repair location in the second level and any inspection lead time required for inspecting the part at the upstream repair location in the second level;

the latest time estimated in the second phase takes into account any repair lead time required for repairing the part at the upstream repair location in the third level and any move lead time required for moving the part back from the upstream repair location in the third level to the upstream repair location in the second level, in addition to any move lead time required for moving the part back from the upstream repair location in the second level to the repair location; and

the start time of the re-planned second move order is an estimated latest time taking into account any move lead time required for moving the part from the upstream repair location in the second level to the upstream repair location in the third level, any inspection lead time required for inspecting the part at the upstream repair location in the third level, any repair lead time required for repairing the part at the upstream repair location in the third level, and any move lead time required for moving the part back from the upstream repair location in the third level to the upstream repair location in the second level, in addition to any move lead time required for moving the part from the repair location to the upstream repair location in the second level, any inspection lead time required for inspecting the part at the upstream repair location in the second level, and any move lead time required for moving the part back from the upstream repair location in the second level to the repair location.

27. The method of Claim 25, wherein the first, second, and third phases are performed for each repair location in each level of the repair network, the first, second, and third phases being performed for each inspected unserviceable part at each such repair location that is not repairable at that repair location.

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28. The method of Claim 15, wherein the method is performed using a replenishment planning engine of a service parts planning system.

29. Software for planning repairs in response to demand in a multi-level repair network, each level within the repair network comprising one or more repair locations at which unserviceable parts may be repaired, the software embodied in a computer-readable medium and when executed operable to:

access a forecasted demand for a specified quantity of serviceable parts at a specified future time at a repair location;

in a first phase, for each of one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

estimate the earliest time at which a repair operation can begin for the part at an upstream repair location; and

plan a move order for moving the part between the repair location and the upstream repair location such that the part can be available for repair at the upstream repair location at the estimated earliest time, the move order having a start time and a delivery time;

in a second phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase, estimate a latest time at which a repair operation can begin with respect to the part at the upstream repair location in order to help satisfy the forecasted demand at the repair location; and

plan a repair order for the part at the upstream repair location at the estimated latest time, the repair order having a start time;

in a third phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the start time of the repair order planned in the second phase, re-plan the move order by modifying the delivery time of the move order according to the start time of the repair order and modifying the start time of the move order according to the modified delivery time of the move order;

the start time of the re-planned move order being an estimated latest time at which the part can be moved from the repair location to the upstream repair location for repair in order to help satisfy the forecasted demand at the repair location.

30. The software of Claim 29, wherein:

the earliest time estimated in the first phase takes into account any move lead time required for moving the part from the repair location to the upstream repair location and any inspection lead time required for inspecting the part at the upstream repair location;

the latest time estimated in the second phase takes into account any repair lead time required for repairing the part at the upstream repair location and any move lead time required for moving the part back from the upstream repair location to the repair location; and

the start time of the re-planned move order is an estimated latest time taking into account any move lead time required for moving the part from the repair location to the upstream repair location, any inspection lead time required for inspecting the part at the upstream repair location, any repair lead time required for repairing the part at the upstream repair location, and any move lead time required for moving the part back from the upstream repair location to the repair location.

31. The software of Claim 30, wherein a repair lead time associated with a repair operation is specified for each part for each repair location and comprises one or more full days.

32. The software of Claim 30, wherein the move order specifies a Bill of Distribution (BOD) and the move lead time associated with the move order comprises one or more full days.

33. The software of Claim 29, wherein the repair order and associated re-planned move order are planned on a just-in-time basis.

34. The software of Claim 29, wherein the repair order and associated re-planned move order are planned on an on-demand basis, the forecasted demand acting as a demand for generating the repair order and the repair order acting as a demand for generating the associated re-planned move order.

35. The software of Claim 29, wherein a part is available to help satisfy the forecasted demand if the part can be at the repair location in a serviceable state at the specified time of the forecasted demand or earlier.

36. The software of Claim 29, further operable to automatically approve planned repair orders and move orders satisfying one or more predefined constraints.

37. The software of Claim 29, wherein the first, second, and third phases are performed for each of a plurality of times within a planning horizon for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location.

38. The software of Claim 29, wherein the first, second, and third phases are performed for each of a plurality of repair locations in a level of the repair network, the first, second, and third phases being performed for each inspected unserviceable parts at each such repair location that is not repairable at that repair location.

39. The software of Claim 29, wherein the repair location is in a first level of the repair network and the upstream repair location is in a second level of the repair network, the software further operable to:

in the first phase, for any of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location and which may also not be repairable at the upstream repair location in the second level:

estimate the earliest time at which a repair operation can begin for the part at an upstream repair location in a third level of the repair network; and

plan a second move order for moving the part between the upstream repair location in the second level and the upstream repair location in the third level such that the part can be available for repair at the upstream repair location in the third level at the estimated earliest time, the second move order having a start time and a delivery time;

in the second phase, for each of these one or more inspected unserviceable parts at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase for the upstream repair location in the third level, estimate a latest time at which a repair operation can begin with respect to the part at the upstream repair location in the third level in order to help satisfy the forecasted demand at the repair location; and

plan a repair order for the part at the upstream repair location in the third level at the estimated latest time for the upstream repair location in the third level, this repair order having a start time;

in the third phase, for each of these one or more inspected unserviceable parts at the repair location.

according to the start time of this repair order planned in the second phase, re-plan the second move order by modifying the delivery time of the second move order according to the start time of this repair order and modifying the start time of the second move order according to the modified delivery time of the second move order;

the start time of the re-planned second move order being an estimated latest time at which the part can be moved from the upstream repair location in the

second level to the upstream repair location in the third level for repair in order to help satisfy the forecasted demand at the repair location.

40. The software of Claim 39, wherein:

the earliest time estimated in the first phase takes into account any move lead time required for moving the part from the upstream repair location in the second level to the upstream repair location in the third level and any inspection lead time required for inspecting the part at the upstream repair location in the third level, in addition to any move lead time required for moving the part from the repair location to the upstream repair location in the second level and any inspection lead time required for inspecting the part at the upstream repair location in the second level;

the latest time estimated in the second phase takes into account any repair lead time required for repairing the part at the upstream repair location in the third level and any move lead time required for moving the part back from the upstream repair location in the third level to the upstream repair location in the second level, in addition to any move lead time required for moving the part back from the upstream repair location in the second level to the repair location; and

the start time of the re-planned second move order is an estimated latest time taking into account any move lead time required for moving the part from the upstream repair location in the second level to the upstream repair location in the third level, any inspection lead time required for inspecting the part at the upstream repair location in the third level, any repair lead time required for repairing the part at the upstream repair location in the third level, and any move lead time required for moving the part back from the upstream repair location in the third level to the upstream repair location in the second level, in addition to any move lead time required for moving the part from the repair location to the upstream repair location in the second level, any inspection lead time required for inspecting the part at the upstream repair location in the second level, and any move lead time required for moving the part back from the upstream repair location in the second level to the repair location.

41. The software of Claim 39, wherein the first, second, and third phases are performed for each repair location in each level of the repair network, the first, second, and third phases being performed for each inspected unserviceable part at each such repair location that is not repairable at that repair location.

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42. The software of Claim 29, the software comprising a replenishment planning engine of a service parts planning system.

43. A system for planning repairs in response to demand in a multi-level repair network, each level within the repair network comprising one or more repair locations at which unserviceable parts may be repaired, the system comprising one or more components collectively operable to:

access a forecasted demand for a specified quantity of serviceable parts at a specified future time at a repair location;

in a first phase, for each of one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

estimate the earliest time at which a repair operation can begin for the part at an upstream repair location, taking into account any move lead time required for moving the part from the repair location to the upstream repair location and any inspection lead time required for inspecting the part at the upstream repair location; and

plan a move order for moving the part between the repair location and the upstream repair location such that the part can be available for repair at the upstream repair location at the estimated earliest time, the move order having a start time and a delivery time;

in a second phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the forecasted demand and the earliest time estimated in the first phase, estimate a latest time at which a repair operation can begin with respect to the part at the upstream repair location in order to help satisfy the forecasted demand at the repair location, taking into account any repair lead time required for repairing the part at the upstream repair location and any move lead time required for moving the part back from the upstream repair location to the repair location; and

plan a repair order for the part at the upstream repair location at the estimated latest time on a just-in-time basis, the repair order having a start time, the forecasted demand acting as a demand for generating the repair order;

in a third phase, for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location:

according to the start time of the repair order planned in the second phase, re-plan the move order on a just-in-time basis by modifying the delivery time of the move order according to the start time of the repair order and modifying the start time of the move order according to the modified delivery time of the move order, the repair order acting as a demand for generating the associated re-planned move order;

the start time of the re-planned move order being an estimated latest time at which the part can be moved from the repair location to the upstream repair location for repair in order to help satisfy the forecasted demand at the repair location, taking into account any move lead time required for moving the part from the repair location to the upstream repair location, any inspection lead time required for inspecting the part at the upstream repair location, any repair lead time required for repairing the part at the upstream repair location, and any move lead time required for moving the part back from the upstream repair location to the repair location.

the first, second, and third phases being performed for each of a plurality of times within a planning horizon for each of the one or more inspected unserviceable parts at the repair location that are not repairable at the repair location.

44. A system for planning repairs in response to demand in a multi-level repair network, each level within the repair network comprising one or more repair locations at which unserviceable parts may be repaired, the repair network comprising a downstream repair location, a final upstream repair location, and one or more intermediate upstream repair locations separating the final upstream repair location from the downstream repair location, the system comprising one or more components collectively operable to:

access a forecasted demand for a specified quantity of serviceable parts at a specified future time at the downstream repair location;

in a first phase, for each of one or more inspected unserviceable parts at the downstream repair location that are not repairable at the downstream repair location:

estimate an earliest time at which a repair operation can begin for the part at each of the upstream repair locations; and

plan a plurality of move orders for moving the part between the downstream repair location and the final upstream repair location such that the part can be available for repair at the final upstream repair location at the estimated earliest time for the final upstream repair location, each move order having a start time and a delivery time;

in a second phase, for each of the one or more inspected unserviceable parts at the downstream repair location that are not repairable at the downstream repair location:

according to the forecasted demand and the earliest times estimated in the first phase, estimate a latest time at which a repair operation can begin for the part at each of the upstream repair locations in order to help satisfy the forecasted demand at the downstream repair location; and

plan a repair order for the part at the final upstream repair location at the estimated latest time for the final upstream repair location, the repair order having a start time;

in a third phase, for each of the one or more inspected unserviceable parts at the downstream repair location that are not repairable at the downstream repair location:

according to the start time of the repair order planned for the final upstream repair location in the second phase, re-plan the move orders by modifying the delivery time of a most upstream move order according to the start time of the repair order, modifying the start time of the most upstream move order according to the modified delivery time of the most upstream move order, modifying the delivery time of a next most upstream move order according to the start time of the most upstream move order, modifying the start time of the next most upstream move order according to the modified delivery time of the next most upstream move order, and continuing in this manner until the start time of a most downstream move order has been modified;

the start times of the re-planned move orders being estimated latest times at which the part can be moved between repair locations for repair at the final upstream repair location in order to help satisfy the forecasted demand at the downstream repair location.